

Notes on some of the British Nepticulidae II

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has now been published by Johansson (1971), and this is the basis of the notes which follow.

The *ruficapitella* group is now considered to comprise eleven species of which six or possibly seven have been recorded from Britain. The British species, which include two new to our list, are as follows:—

Stigmella suberivora Stainton 1869

S. svenssoni Johansson 1971 (*ruficapitella* Haw. auct. partim)

S. basiguttella Heinemann 1862

S. atricapitella Haworth 1829

S. ruficapitella Haworth 1829

?*S. samiatella* Zeller 1839

S. roborella Johansson 1971 (*ruficapitella* Haw. auct. partim)

At the time when Johansson's paper was written, *svenssoni* had not been recognised in Britain, but Borkowski has since found a specimen amongst the material I sent him for examination. The doubtful species is *S. samiatella* and I will explain below the slender evidence on which its claim rests.

Some of the species, especially in the male sex, are relatively easy to distinguish by their external features, but others, notably the red-headed females, are very similar and can only be determined with certainty by dissection of the genitalia. These organs are admirably illustrated and described by Johansson, and I must refer the reader who wishes to make genitalia preparations to his paper for the necessary information.

It may come as a bit of a shock to some microlepidopterists to learn that the males of *ruficapitella* normally have black heads; however, since the head is red in the female, Haworth's name still remains appropriate. It was this sexual dimorphism which led some entomologists (e.g. Meyrick, 1928) to believe that *atricapitella* and *ruficapitella* were one and the same species, red-heads and black-heads having been found *in copula*.

There follow provisional dichotomous tables for the determination of the two sexes. These are based partly on Johansson's descriptions and partly on the study of my own specimens which were kindly named for me by Borkowski after dissection. The tables are a cock-shy, and constructive criticism will be welcome.

Key for the determination of oak-feeding Stigmellidae

(a) Males

- | | |
|--|---|
| 1. With androconial scales on hindwing | 2 |
| Without androconial scales on hindwing | 4 |

- | | |
|--|----------------------|
| 2. Head ferruginous | <i>suberivora</i> |
| Head black or brown | 3 |
| 3. Androconial scales two-thirds length of fringes | <i>atricapitella</i> |
| Androconial scales one-third length of fringes | <i>ruficapitella</i> |
| 4. Head ferruginous to orange | 5 |
| Head black or dark to light brown | 6 |
| 5. Hindwings mixed with a few brown or bronzy scales | <i>roborella</i> |
| Hindwings without brown or bronzy scales | <i>svenssoni</i> |
| 6. Forewings with a yellowish basal spot | <i>basiguttella</i> |
| Forewings without yellowish basal spot | <i>samiatella</i> |
- (b) *Females*
- | | |
|---|----------------------|
| 1. Head ferruginous | 2 |
| Head not ferruginous | 5 |
| 2. Antennal eyecaps concolorous with head | <i>suberivora</i> |
| Antennal eyecaps lighter than head | 3 |
| 3. Hindwings mixed with brown or bronzy scales;
Ovipositor protrudes | <i>roborella</i> |
| Hindwings without brown or bronzy scales;
Ovipositor does not protrude | 4 |
| 4. Hindwings pale grey; <i>bursa copulatrix</i> with a large
sclerotised plate | <i>svenssoni</i> |
| Hindwings darker shining grey; <i>bursa copulatrix</i>
without a large sclerotised plate | <i>ruficapitella</i> |
| 5. Forewings with a yellowish basal spot | <i>basiguttella</i> |
| Forewings without such a spot | 6 |
| 6. Hindwings grey, mixed with bronzy scales; face
yellow | <i>samiatella</i> |
| Hindwings grey without such scales; face
ochreous brown | <i>atricapitella</i> |

These tables should make it possible for many specimens to be determined without dissection. Males of *svenssoni* and *roborella* and females of these two species and *ruficapitella* are the hardest to distinguish, and with these it is best to examine the genitalia. The androconial scales can be seen easily with a low-powered lens.

It is not yet known whether the larval mines will give constant characters for determination. The statement by the older entomologists that the mines of *atricapitella* and *ruficapitella* are indistinguishable is nugatory, being based on inadequate information. The only way to build up precise knowledge is for breeders to keep each individual larva in a separate container and to press the leaf as soon as it has vacated its mine. A reliable cross reference system must be established between bred imagines and the leaves in which their larvae fed. This is a laborious task, but essential if we are to learn the characteristics of the mines of each species. The descriptions of mines given below are based partly on Johansson's work and partly on my own observations; the

reader must accept the fact that our information in this area is still rudimentary, and should realise how desirable it is that he himself should add to our fund of knowledge.

We must also make a fresh start with mapping the distribution of each species. Past records for *atricapitella* may equally refer to *ruficapitella* or, just possibly, *samiatella*, while the records for *ruficapitella* may refer to that species, *roborella* or *svenssoni*. Every entomologist should therefore publish his records after he has determined his series correctly.

I shall now give more detailed descriptions of the species and their biology, but I shall not include *suberivora* and *basiguttella* since they should pose no problems of identification either as larvae or imagines.

(1). *Stigmella atricapitella* Haworth. Head black in both sexes, face in the female conspicuously tawny-ochreous (Johansson ascribes this facial coloration to both sexes, but in my series it seems to be rare in the male). Eyecaps white. Collar dark brown in the male, white in the female. Forewings dark bronzy brown with a strong metallic gloss, towards the apex with a more or less pronounced bluish violet lustre. In the male the dorsum is clad with long, dark cilia almost to the base. Hindwings blackish grey, those of the male with conspicuously thickened androconial scales on the costa and dorsum, about three quarter the length of the fringes.

The mine is not described by Johansson, who states that it cannot be reliably separated from that of *ruficapitella*. I have bred this species from rather short broad mines with the frass packed in a thick, nearly solid, central line. The egg has been on the underside of the leaf in the confirmed *atricapitella* mines. The larva feeds on *Quercus robur*, *petraea* and *pubescens*.

Distribution. A common and widespread species, probably occurring throughout Britain.

(2). *Stigmella ruficapitella* Haworth. The head in the male is generally black but may be brown or even yellowish brown; in the female it is ferruginous to orange. The collar in the male is almost black in most cases, but may be white in lightish-headed specimens; in the female it is yellowish white to white. The eyecaps are yellowish white to white. The forewings are dark bronzy brown with less metallic gloss than in *atricapitella* and a less pronounced bluish violet lustre at the apex. The hindwings in the male are dark grey with androconial scales on the costa and dorsum one-third the length of the fringe; in the female they are medium grey and distinctly glossy.

According to Johansson, the mine is in most cases shorter than that of other oak-feeding species and often follows the margin of the leaf. On the other hand, my own authentic *ruficapitella* mines have been somewhat longer than those of

atricapitella; the frass has been more dispersed, each grain being separated from its neighbour. The egg has been laid on the upperside of the leaf. The larva feeds on *Quercus robur* and *petraea*.

Distribution. It seems to be as common and as widely distributed as the preceding species.

Beirne's genitalia drawing of *atricapitella* in fact depicts this species.

(3). *Stigmella samiatella* Zeller. Sexes alike, head from black or dark brown to brown or yellow-brown; forehead yellow. Collar white. Antennal eyecaps white. Forewings dark bronzy brown with a strong metallic gloss on the apical area with a violet tint. Hindwings dark grey mixed with bronzy or violet scales, in the female sometimes somewhat lighter.

Johansson does not describe the mine, but from his drawing it appears closely to resemble that of *ruficapitella*. According to Hering (1957), the egg is on the underside of the leaf. The larva feeds on *Quercus robur*, *petraea*, *pubescens* and *Castanea sativa*.

This species was placed on the British list after vacated mines had been sent to Professor Hering and determined by him as those of *samiatella* (Parmenter, 1952). In the light of our recent advances in knowledge of this group, this evidence is no longer acceptable. However, *samiatella* is so common and widespread on the continent that Borkowski thinks it improbable that it does not also occur in Britain. He may well prove right. Yet I have examined over 300 specimens of this group in collections without finding a single *samiatella*. One must beware of examples of *basiguttella* with the basal pale spot more or less obsolete; these, since they lack androconial scales and have black heads with yellow faces, could readily be mistaken for *samiatella*. How easily such specimens of *basiguttella* may be misidentified is proved by the collections of two meticulous entomologists, Waters and L. T. Ford. The former had one and the latter no fewer than 18 specimens of *basiguttella* labelled as *atricapitella*. One of Beirne's *atricapitella* genitalia slides made from a Ford specimen is in fact *basiguttella*: how puzzled Beirne must have been!

(4). *Stigmella roborella* Johansson. Sexes alike. Head and forehead ferruginous to orange. Collar and antennal eyecaps white or yellowish white. Forewings rather dark bronzy brown with a faint metallic gloss. Hindwings pale grey mixed with a few brown or bronzy scales. In the female the ovipositor protrudes more than in the related species of the group.

The mine is relatively long and contorted and has the frass in rather a thin central line. The larva will feed on most species of deciduous oak.

Distribution. This is one of the commonest species on the continent, but appears to be less so in Britain. However, many

cabinet specimens labelled *ruficapitella* will be found to be *roborella*. Confirmed identifications show that it is widespread, but the preliminary indications are that it is only as common as the two preceding species in the Midlands.

According to Johansson, Beirne's genitalia drawing of *ruficapitella* depicts *hemargyrella*, but it is improbable that even Beirne mistook a strongly fasciated species for a *ruficapitella*. The specimen was from Ford's collection and it is inconceivable that Ford should have made such a mistake. Unfortunately Ford was more interested in the quality of his cabinet specimens than their scientific value, and destroyed all those dissected (he would have said 'mutilated') by Beirne. In my opinion the figure depicts *roborella*, though it is not a very satisfactory representation.

(5). *Stigmella svenssoni* Johansson. Differs superficially from the preceding species in the hindwings, which are paler, lacking the bronzy scales, and in the females because the ovipositor does not protrude. The genitalia are distinct in both sexes.

The mine has not yet been described.

Distribution. The species has been found on the continent in Sweden, Finland, Hungary and Italy. So far only two British specimens have been recognized. One of these I bred on the 15th May, 1969, from a larva collected the previous autumn at Madingley, Cambridgeshire; this specimen, dissected by Borkowski established *svenssoni* as a British insect and will, in due course, be placed in the British Museum (Natural History). The other was captured by Mr E. C. Pelham-Clinton at Ardnamurchan, Argyllshire. No doubt other specimens await discovery in collections, but it seems on our present evidence that this is a rare species.

Let me conclude this section with two brief notes on *Stigmella suberivora* Stainton.

(1). Although this species is generally considered to be univoltine (Waters 1928, Meyrick 1928, Ford 1949, Hering 1957), Wakely (1937) records finding tenanted mines on *Quercus ilex* in the Isle of Wight in mid-August and breeding an imago on the 2nd of September. As far as I know, this is the only record of a summer brood of *suberivora* and I failed in a search for larvae at a locality in Essex. I suggest that entomologists should keep a lookout for summer larvae and report them if they are found.

(2). An additional locality which reached me too late for my previous notes is Sittingbourne, Kent, where Dr Ian Watkinson reports finding the mines plentifully.

B. *Ectoedemia* (*Dechtiria*)

Ectoedemia (Busck 1907) was formerly used as the generic name of a group of *Nepticula* mining petioles, but now has been extended to embrace the leaf-mining species of the genus

Dechtria (Beirne 1945) which it supersedes in obedience to the rule of priority. In this genus we have a new oak-feeding species, *Ectoedemia quercifoliae* Toll, 1937, to add to the British list and a life-history to be rewritten for *E. atrifrontella* Stainton, which was formerly supposed to feed on *Genista* (Meyrick 1928, Ford 1949).

In my previous notes (*Ent. Record* 83: 248) I stated that not all mines of the *subbimaculella* type had the characteristic slit in the cuticle of the leaf, which meant either that we had an additional species or that *subbimaculella*'s slit was optional.

Accordingly I made it my task in the autumn of 1971 to try to resolve this question. In some localities such as north-west Kent only typical *subbimaculella* mines were to be found, but in north Essex, mines without a slit were as common as those possessing that feature. An examination of the larvae within the mines showed without doubt that two species were present, for those in the slitless mines all had red-brown heads, as opposed to the blackish brown heads of the larvae in the mines which sported the slit cuticle. This distinction was constant and a division of a large sample of leaves (about 50 of each kind) on larval coloration yielded identical results to another based on mine form. Reference to Hering (1957) showed that the new species was *Ectoedemia quercifoliae* Toll.

I sent some of the mines to Dr Klimesch in Austria and he confirmed the determination but questioned whether *quercifoliae* was distinct from *E. albifasciella* Heinemann since the larvae look alike and the imagines are indistinguishable both in outward appearance and genitalia. In reply I gave three reasons why I thought they were separate species. They are as follows:

(i) Time of appearance. In England *albifasciella*'s larva feeds in green leaves in late August and early September, whereas *quercifoliae* feeds in "green islands" in withered or fallen leaves in late October and early November. *Albifasciella* has been demonstrated to be univoltine, so there is no question of *quercifoliae* being its second brood.

(ii) Structure of the mines. (a) *albifasciella*. The mine starts as a slender gallery following the veins with the frass in a fine central line leaving clear margins. This leads abruptly into a squarish blotch where the frass is deposited along one side or in a corner. The blotch is generally well away from the midrib and hardly ever occupies the angle between the midrib and a lateral vein.

(b) *quercifoliae*. The mine starts with a similar slender gallery but the line of frass is broad leaving no clear margins. The transition to a blotch is gradual, the latter being often elongated or formed in a series of contiguous 'S' turns. The frass is deposited in a dense black mass behind the larva as

(to be continued)